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AUTHOR Horowitz, Alan B.; Horowitz, Valerie A.
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ABSTRACT

Two experiments examined the effects of task-specific instructions on the recall and recognition memory of kindergarten, 2nd and 5th grade children for pictorial stimuli. In Experiment 1, a recall test was used and prior to stimulus presentation subjects were given one of three instructions: either a Recall-specific set, a general Remember set, or a misleading Recognition-specific set. Recall data indicated no instruction differences at the kindergarten level, differences favoring the Recall-specific over the Recognition-specific set at grade 2, and differences favoring the Recall-specific over both the Remember and Recognition-specific sets at grade 5. In Experiment 2, the same instruction sets and stimuli were presented, but followed by a recognition test. Recognition data revealed no instruction effects at grade 5 (due to a ceiling effect), differences favoring the Recognition-specific and Recall-specific sets at grade 2, and scores favoring the Remember set at the kindergarten level. These findings were seen to reflect the uneven development of recall- and recognition-specific memory capabilities. The role of particular encoding and storage activities was discussed. (Author/JMB)

The Effects of Task-Specific Instructions on the Encoding Activities of Children in Recall and Recognition Tasks[1]

Alan B. Horowitz
University of California, Davis

Valerie A. Horowitz
California State University, Sacramento

Abstract

Two experiments studied the effects of task-specific instructions on the recall and recognition memory of kindergarten, second-, and fifth-grade children for pictorial stimuli. In Experiment 1, a recall test was used and prior to stimulus presentation subjects were given one of three instructions: either a Recall-specific set, a general Remember set, or a misleading Recognition-specific set. Recall data indicated no instruction differences at the kindergarten level, differences favoring the Recall-Specific over the Recognition-specific set at grade 2, and differences favoring the Recall-specific over both the Remember and Recognition-specific sets at grade 5. In Experiment 2, the same instruction sets and stimuli were presented, but followed by a recognition test. Recognition data revealed no instructions effects at grade 5 (due to a ceiling effect), differences favoring the Recognition-specific and Recall-specific sets at grade 2, and scores favoring the Remember set at the kindergarten level. These findings were seen to reflect the uneven development of recall- and recognition-specific memory capabilities, and the role of particular encoding and storage activities were discussed.

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The Effects of Task-Specific Instructions on the Encoding Activities of Children in Recall and Recognition Tasks

Alan B. Horowitz
University of California, Davis

Valerie A. Horowitz
California State University, Sacramento

In recent years there have been numerous studies of the development of memory capabilities in children. Many of these studies have focused on recall and recognition memory, and have uncovered interesting patterns in the development of some general and specific skills and abilities that are needed to perform well in recall- and recognition-type memory tasks. The overall impression that one gets when looking through this literature is that recall memory seems to increase with age across the middle childhood years, and this seems due to the acquisition and use of more effective stimulus encoding, storage, and retrieval activities (e.g., Belmont and Butterfield, 1971; Cole, Frankel and Sharp, 1971; Flavell, 1970; Hagen and Kingsley, 1968; Kobasigawa, 1974; and Neimark, Slotnick and Ulrich, 1971). Recognition memory, on the other hand, seems to develop sooner than recall memory, with even pre-school children displaying extremely accurate recognition memory and evidencing scores that are fairly comparable to those of older children and, in some instances, to even those of adults (e.g., Brown, 1973; Brown and Scott, 1971; Entwisle and Huggins, 1973; Perlmutter and Myers, 1974; and Tversky, 1973a). These differing patterns for recall and recognition memory raise several interesting developmental questions: first, are these differences largely a function of the way that children at different age levels make use of some general memory skills and abilities in recall- and recognition-type tasks (with recall tasks being more difficult than recognition tasks),

or do these differing patterns reflect the uneven development of specific recall and recognition capabilities? and second, how aware are the children themselves of these developing capabilities?

The present study probed aspects of both of the above questions by focusing on the operational question of when, developmentally, do children who have been given explicit instructions about the nature of a forthcoming retention test display the ability to adapt their stimulus encoding and/or storage activities to meet the demands of that test? Two experiments were conducted, the first looking for the development and use of recall-specific capabilities and the second looking for evidence of recognition-specific capabilities. In both experiments the subjects were boys and girls from grades K, 2, and 5 (mean CA's of 5-8, 7-4, 11-1, respectively), and the same 12 line-drawings of familiar objects presented in slide form served as the to-be-retained task stimuli (e.g. tree, hat, cup, chair, bread).

Method

In Experiment 1, children from each grade level were randomly assigned to one of three different instruction groups and given their respective task instructions prior to presentation of the task stimuli. The three instruction groups included (1) a Recall-Specific group in which subjects were told that they would see a series of pictures and that afterwards they would be asked to tell the experimenter the names of as many of these pictures as possible, (2) a more general Remember instruction group in which subjects were told that they would see a series of pictures and that they should try to remember them, and (3) a misleading Recognition-Specific instruction group in which subjects were told that they would see a series of pictures and that afterwards they would be asked to pick

out each from an array that would also include other pictures. This latter instruction group was included in the hope of finding some indirect evidence for the use of recognition-specific retention activities, the use of which might produce lower recall scores due to the possible "inappropriateness" of these activities for the more difficult recall task.

In addition to their respective instructions, subjects were given brief pre-test experiences. In the Recall-Specific and Recognition-Specific instruction groups the subjects were presented with colored circles as the to-be-recalled or to-be-recognized task stimuli. These stimuli were then followed by a corresponding recall or recognition test. Subjects in the Remember instruction group were also given a brief "pre-test" experience to offset the possiblity that a "warm-up effect" might favor the subsequent recall of subjects in the two task-specific groups. These subjects were presented with the same colored circles but out of focus, and asked to tell the experimenter (who was operating the focus control of the slide projector) when each circle was back in focus. Finally, each subject's respective task instructions were reiterated briefly and the main task began with the presentation of the 12 stimuli. After the last stimulus was presented an immediate free recall test was given.

Briefly, Experiment 2 had essentially the same design as Experiment 1, with one major exception: as we were looking for evidence of recognition-specific activities, all of the subjects in this experiment were given a recognition test after the task stimuli were presented. The subjects were again, from the grades K, 2, and 5, and the same three instruction sets were used. Here, of course, the Recognition-Specific instruction set corresponded to the subsequent retention test, whereas the Recall-Specific instructions

were the misleading set. As for the recognition test itself, the 12 task stimuli were randomly interspersed among 24 "filler" pictures all displayed in a 6 x 6 item array. These additional pictures were also line drawings of common objects that were known to all of our subjects. The recognition display was presented to subjects with the offset of the last task stimulus and they were instructed to pick out as many of the previously presented pictures as possible. Their selections, both correct and incorrect, were recorded by the experimenter.

Results and Discussion

The mean performance scores of subjects in Experiment 1, the recall experiment, are presented in Table 1.

Insert Tables 1 and 2 here

These scores represent the mean percentages of correct recall evidenced by children in each instruction group at each grade level. The mean scores presented in Table 2 represent the "corrected" percentages for the recognition accuracy of subjects in Experiment 2. An effort was made to correct each subject's recognition score for instances of chance guessing by subtracting the number of incorrectly recognized filler items from the number of correctly recognized task stimuli. This was a conservative measure of recognition accuracy for subjects were penalized for each error of commission and not awarded credit for each correctly identified filler item.

The recall data from Experiment 1 were evaluated by a 3-way ANOVA (Instruction Set x Grade Level x Sex). This analysis revealed significant main effects for both the Instruction Set ($F(2, 90) = 4.97$, $p < .01$) and

Grade Level (F (2, 90) = 46.95, $p < .001$) variables, and an Instruction Set x Grade Level x Sex interaction (F (4, 90) = 3.26, $p < .05$). A follow-up on the two main effects by Duncan's Multiple-Range Test indicated that recall scores in the three instruction groups did not differ significantly at our lowest grade level, K, but did differ at each of the two higher grade levels, 2 and 5. More specifically, the scores of subjects in the Recall-Specific instruction group were found to be significantly higher than those displayed in the misleading Recognition-Specific instruction group at grade level 2 ($\alpha < .05$), while the scores of subjects in the Recall-Specific instruction group were superior to those found in both the Remember and Recognition-Specific instruction groups at grade level 5 (α's $< .05$). It thus seems that at least by age 11, the age of most of our fifth graders, some recall-specific activities have developed and can be used effectively to facilitate performance in an anticipated recall-type task. Drawing upon work by Flavell (1970) and his associates (e.g., Daehler, Horowitz, Wynns & Flavell, 1969; Flavell, Friedrichs & Hoyt, 1970; and Moely, Olson, Halwes & Flavell, 1969), we suspect that these activities might entail any of the following activities: the repeated and covert labeling of the present stimuli, the cummulative rehearsal of these labels, some subjective organization of these stimuli, and perhaps some elaborative strategy such as constructing an associative network around each stimulus. In essence, we believe that these activities are primarily verbal in nature as opposed to iconic (à la Bruner, 1964), although iconic processing might be used in conjunction with or to supplement some verbal processing in the course of more sophisticated encoding and storage activities.

Some of these suspected activities, in particular the repetitive labeling and perhaps the cummulative rehearsal, may also be available to second graders, although judging from the absence of a significant difference between the scores of subjects in the Recall-Specific and Remember instruction groups, these activities (if available) did not serve to differentially facilitate the subsequent recall of subjects in the Recall-Specific instruction group. In this respect, it is possible that these less sophisticated encoding and storage activities may be present by age 7 or 8, but represent a more general strategy for the retention of stimulus information (i.e., one elicited by both the present Recall-Specific and Remember instruction sets).

In contrast, we do not believe that kindergarten age children spontaneously and knowingly generate any recall-specific encoding activities. In line with some of the theorizing of Flavell and his associates (Appel, Cooper, McCarrell, Sims-Knight, Yussen, & Flavell, 1972), our recall data suggest that while kindergarteners may comprehend each of our instruction sets (at least well enough to carry out their respective pre-test), they are probably not aware of the possibility that the performance of a particular behavior on their part during stimulus presentation may specifically serve to facilitate their recall during testing.

As for our data pertaining to recognition-specific activities, a 3-way ANOVA (Instruction Set x Grade Level x Sex) was performed on the corrected recognition scores from Experiment 2. This analysis revealed the presence of a significant main effect for Grade Level ($F(2,90) = 14.81$, $p < .001$), and a significant Instruction Set x Grade Level interaction ($F(4,90) = 3.89$, $p < .01$). A follow-up Duncan's Multiple-Range Test indicated the absence of any significant instruction differences at grade level 5 (probably due to a

"ceiling effect"), the presence of significant differences favoring the Recognition-Specific and Recall-Specific instruction groups at grade level 2 (α's < .05), and the presence of significant instruction differences surprisingly enough favoring the Remember instruction group at grade level K (α's < .05).

This pattern of instructional differences seems to indicate that at least by age 7 or 8 (the age of most second-graders), or perhaps somewhat earlier, some recognition-specific mediational activities may be available for use when a recognition test is anticipated. Evidence from Experiment 1 also supports this interpretation: namely, the fact that second graders in the Recognition-Specific instruction group displayed poorer recall than their classmates in the Recall-Specific instruction group. This difference in their recall scores probably reflects the truly misleading nature of the Recognition-Specific instruction set for children at this age level, a set that may have prompted the use of an available, yet for recall purposes, a less effective recognition-specific mediational activity. We would speculate that such an activity might entail some more deliberate visual or iconic processing of the task stimuli, such as selectively attending to and encoding some very salient physical feature(s) of the task stimuli, or perhaps even relating some of the stimuli to one another in representational space (e.g., picturing a table with a loaf of bread and a cup on it, and a chair to one side). But a recognition-specific activity may also entail some verbal encoding as indicated by the work of Frost (1972) and Tversky (1973b) with adult subjects, and this may be why the recognition scores of second graders in the Recognition-Specific and Recall-Specific instruction groups were as comparable as they were. Presumably, some of the less

sophisticated, and perhaps more general, verbal activities of subjects in the Recall-Specific instruction group did serve to facilitate their performance during the subsequent recognition test.

Finally, some comments seem in order concerning our most surprising finding, the superiority of kindergarten recognition scores following the more general Remember instruction set. If reliable, this finding may indicate that for children at this young age the term "remember" when used in memory task instructions, may be sufficient in and of itself (as opposed to more explicit task instructions) to elicit the young child's most effective stimulus retention activities (though not necessarily due to their deliberate use). This instructional salience may reflect the high affective value that the word "remember" acquires in the course of the steady stream of directions typically given to children of this age by significant adults (e.g., "Remember to close the door," "Remember, play nicely," "Remember to kiss grandma." and so on). On the other hand, this instructional difference could reflect the possibility that our kindergarteners may have interpreted both sets of task-specific instructions a bit too literally. That is, they may have viewed our tasks as tasks in which the participant was not being asked to do anything specific to try and remember the various pictures at the time of presentation, but rather to perform a particular type of response at the time of testing. In this sense, our task-specific instructions may have served to de-emphasize the importance of deliberate encoding activities in favor of a less productive "wait-'til-testing" strategy. If correct, this view may help to understand why young children seem to display very little evidence of spontaneous encoding and storage activities during the presentation phase of studies

in the memory task literature. For the moment, however, we must first replicate our finding of instruction differences favoring the Remember instruction set at the Kindergarten level before we can probe either our "salience hypothesis" concerning the use of the term "remember" in memory task instructions, or our "mis-interpretation hypothesis" concerning the use of test-specific instructions in memory tasks with young children.

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TABLE 1

Mean Percentage of Correct Recall at Each Grade Level Following the Three Instruction Sets

Task Instructions	Grade Level K	2	5
Recall Specific	47.91	50.70	70.14
Remember	49.30	45.14	61.11
Recognition Specific	44.44	43.05	61.81

TABLE 2

Mean Percentage of Corrected Recognition for Each Grade Level Following the Three Instruction Sets

Task Instructions	Grade Level K	2	5
Recognition Specific	79.18	90.65	95.86
Remember	90.20	80.56	97.92
Recall Specific	80.57	89.96	94.80